

Audit

Report



YEAR 2000 COMPUTING ISSUES:
DEFENSE LOGISTICS AGENCY - STANDARD AUTOMATED
MATERIEL MANAGEMENT SYSTEM

Report No. 99-215

July 16, 1999

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Acronyms

DISA	Defense Information Systems Agency
DLA	Defense Logistics Agency
DLSC	Defense Logistics Support Command
DSC	Defense Supply Center
DSDC	Defense Logistics Agency Systems Design Center
EDI	Electronic Data Interchange
OSD	Office of the Secretary of Defense
SAMMS	Standard Automated Materiel Management System
Y2K	Year 2000



INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202

July 16, 1999

MEMORANDUM FOR DIRECTOR, DEFENSE LOGISTICS AGENCY

SUBJECT: Audit Report on Year 2000 Computing Issues: Defense Logistics Agency - Standard Automated Materiel Management System (Report No. 99-215)

We are providing this report for information and use. This report is one of a series of reports being issued by the Inspector General, DoD, in accordance with an informal partnership with the DoD Chief Information Officer to identify progress made by DoD Components that are preparing information and technology systems for year 2000 compliance. We considered management comments on a draft of this report in preparing the final report.

Comments from the Defense Logistics Agency conformed to the requirements of DoD Directive 7650.3 and left no unresolved issues. Therefore, no additional comments are required.

We appreciate the courtesies extended to the audit staff. Questions on the audit should be directed to Mr. Tilghman Schraden at (703) 604-9186 (DSN 664-9186), email <tschraden@dodig.osd.mil> or Ms. Kathryn Palmer at (703) 604-8840 (DSN 664-8840), email <kpalmer@dodig.osd.mil>. See Appendix B for the report distribution. The audit team members are listed inside the back cover.

Robert J. Lieberman
Assistant Inspector General
for Auditing

Office of the Inspector General, DoD

Report No. 99-215
(Project No 8LD-9021.02)

July 16, 1999

Year 2000 Computing Issues: Defense Logistics Agency- Standard Automated Materiel Management System

Executive Summary

Introduction. This is one in a series of reports being issued by the Inspector General, DoD, in accordance with an informal partnership with the Chief Information Officer, DoD, to monitor DoD efforts to address the year 2000 computing challenge. This report addresses year 2000 issues that pertain to the Standard Automated Materiel Management System (SAMMS), which provides support to the Defense Logistics Agency (DLA) for the management of consumable items. For a complete listing of audit projects, see the year 2000 webpage on the IGnet at <http://www.ignet.gov>.

SAMMS consists of a standard set of materiel management functions common to all three DLA supply centers and supply center unique functions. SAMMS ranked third in mission-critical DLA automated systems in need of remediation. SAMMS was developed during the 1960s to provide support for the management of consumable items for DLA. The standard SAMMS functions comprised five subsystems: acquisition management, asset management, financial management, requirements determination, and technical and logistics support. SAMMS provides for the management of six commodity groups. Those commodities are: clothing and textiles; electronics; construction; industrial; medical; and general supplies. DLA certified SAMMS as Y2K compliant on March 30, 1999.

Objectives. The overall audit objective was to evaluate whether DLA was adequately planning for and managing year 2000 risks to avoid undue disruption to its supply mission. This audit, the third in a series on the DLA supply mission, focused on the core DLA supply system, SAMMS. Specifically, we reviewed year 2000 interface agreements, testing plans, contingency plans, and continuity of operations plans. Additional areas of the "DoD Year 2000 Management Plan," December 1998, (DoD Management Plan) that we assessed included contracts, funding, information assurance, management oversight and reporting, and prioritization and inventorying of mission-critical systems and infrastructure.

Results. DLA and its three subordinate supply centers had taken action to ensure that SAMMS would be year 2000 compliant. Actions that DLA took included: the implementation of Y2K contract clauses; the allocation of necessary funds, the implementation of an information assurance program, the establishment of management oversight and reporting, and the prioritization and inventorying of mission-critical systems and infrastructure. Additionally, DLA developed contingency and test plans and performed Y2K testing. However, DLA did not

fully comply with the requirements of the DoD Management Plan regarding interfaces, test documentation, and milestones. Although DLA did not fully comply with the DoD Management Plan, it subjected SAMMS to intensive testing before certification. Additional testing and the logistics end-to-end testing would provide further assurance that the DLA core supply mission performed by SAMMS would be year 2000 compliant. See the Finding section for details of the audit results.

Management Actions Taken During the Audit. DLA had not planned to install the final SAMMS upgraded software on the mid-tier computers^{*} until May 1999 although the DoD Management Plan established March 31, 1999, as the final implementation date for making systems fully year 2000 compliant. Based on our findings, DLA accelerated the fielding dates of the final software upgrades for mid-tier computers to April 5, 1999.

Summary of Recommendation. We recommend that the Director, DLA review SAMMS interfaces to ensure they all have been identified and will be tested during the scheduled logistics functional end-to-end testing from April through June 1999.

Management Comments. DLA concurred with the recommendation, stating that a function of the end-to-end testing plan was to ensure that all critical thread interfaces were identified and included in the test. The Capstone (logistics) end-to-end testing began on May 25, 1999, and was scheduled for completion on July 16, 1999. See the Finding section of the report for a discussion of the management comments and the Management Comments section of the report for the complete text of the comments.

^{*}Mid-tier computers are often called "mini-computers" and are less powerful than mainframes. They have many of the same operational characteristics of a mainframe but do not require a specialized operating environment. Mid-tier computers are typically operated in an office environment.

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Background

Policies on Year 2000 Issues. Because of the potential failure of computers to function throughout the Government, the President issued Executive Order 13073, "Year 2000 Conversion," February 4, 1998, making it policy that Federal agencies ensure that no critical Federal program experiences disruption because of the year 2000 (Y2K) problem. The order requires that the head of each agency ensure that efforts to address the Y2K problem receive the highest priority attention in the agency.

DoD Year 2000 Management Strategy. In his role as the DoD Chief Information Officer, the Senior Civilian Official, Office of the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence), issued the "DoD Year 2000 Management Plan" (DoD Management Plan) version 2.0, in December 1998. The DoD Management Plan required DoD Components to implement a five-phase (awareness, assessment, renovation, validation, and implementation) Y2K management process. The DoD Management Plan required completion of the implementation phase for mission-critical systems by December 31, 1998.

Standard Automated Materiel Management System. The Defense Logistics Agency (DLA) completed the implementation phase on April 5, 1999, and certified the Standard Automated Materiel Management System (SAMMS) as Y2K compliant on March 30, 1999. SAMMS consists of a standard set of materiel management functions common to all three DLA supply centers and supply center unique functions. SAMMS ranked third in mission-critical DLA automated systems in need of remediation. SAMMS was developed during the 1960s to provide support for the management of consumable items for DLA. The standard SAMMS functions comprised five subsystems: acquisition management, asset management, financial management, requirements determination, and technical and logistics support. SAMMS provides for the management of six commodity groups. Those commodities are: clothing and textiles; electronics; construction; industrial; medical; and general supplies.

The three supply centers are the Defense Supply Center (DSC) Columbus, the DSC Philadelphia, and the DSC Richmond. Each DSC is responsible for the management of commodity groups that are unique to that center and require commodity specific management tools. As a result, each DSC has a multitude of center unique subprograms designed to allow the management of its commodities. SAMMS runs on mainframe domains located at the Defense Megacenter, Columbus, and mid-tiers¹ and personal computers located at the supply centers. The DLA management strategy for fixing Y2K problems requires centralized management and decentralized implementation. The following are key positions and organizations responsible for ensuring that SAMMS is Y2K compliant:

¹Mid-tier computers are often called "mini-computers" and are less powerful than mainframes. They have many of the same operational characteristics of a mainframe but do not require a specialized operating environment. Mid-tier computers are typically operated in an office environment.

- Defense Information Systems Agency (DISA) is the central manager for major portions of the Defense information infrastructure. DISA is responsible for planning, developing, and supporting command, control, communications, computers, and intelligence operations functions. In that capacity, DISA provides support to the DoD Chief Information Officer in executing Y2K initiatives, which includes maintenance of a list of tools to assist in resolving Y2K problems and a list of all commercial off-the-shelf products and their status as to Y2K compliance. DISA is also responsible for operating 16 computer processing organizations referred to as megacenters.
- The DLA Chief Information Officer serves as the chief focal point for the planning, management, and execution of the DLA Y2K program. The DLA Y2K Program Office provides the direct oversight of DLA Y2K efforts and reports to the DLA Chief Information Officer.
- Defense Logistics Support Command (DLSC), a major subordinate command of DLA, provides centralized logistics support to the Military Departments as well as Federal civil agencies and foreign governments. DLSC is responsible for the preparation and the execution of the DLSC Y2K oversight program and for prioritizing critical systems and making resource recommendations.
- The DLA Systems Design Center (DSDC) was disestablished in November 1998 and its operations and personnel transitioned to other elements within DLA. The personnel responsible for SAMMS were assigned to DLSC. For simplicity, we have referred to the role played by the former DSDC personnel by their former organizational name throughout this report. The former DSDC personnel are responsible for the same Y2K functions that were previously performed by the DSDC. Those functions include acting as the central design activity responsible for addressing and resolving hardware and software related problems associated with Y2K compliance of SAMMS.
- Defense megacenters operate on a fee-for-service basis in providing mainframe computer processing service to functional users. Defense megacenters are the primary providers of mainframe computer services to functional users in the Army, the Navy, the Air Force, the Marine Corps, and the Defense agencies (such as DLA). Defense megacenters are responsible for the Y2K compliance of its computer hardware and the executive software.

Objectives

The overall audit objective was to evaluate whether DLA was adequately planning for and managing Y2K risks to avoid undue disruption to its supply mission. This audit, the third in a series on the DLA supply mission, focused on the core DLA supply system, SAMMS. Specifically, we reviewed contingency plans and continuity of operations plans, Y2K interface agreements, and testing

plans. Additional areas of the DoD Management Plan that we assessed included contracts, funding, information assurance, management oversight and reporting, and prioritization and inventorying of mission-critical systems and infrastructure. See Appendix A for a discussion of the scope and methodology and for a summary of prior coverage.

Status of the Standard Automated Materiel Management System Year 2000 Program

DLA and its three subordinate supply centers had taken action to ensure that SAMMS would be Y2K compliant. Specifically, DLA:

- implemented Y2K contract clauses,
- allocated necessary funds,
- implemented an information assurance program,
- established management oversight and reporting,
- prioritized and inventoried mission-critical systems and infrastructure,
- developed contingency and test plans, and
- performed Y2K testing.

However, DLA did not fully comply with the requirements of the DoD Management Plan. DLA did not comply with the requirements because it did not fully document interfaces, did not document all test results, did not meet the Y2K certification milestone of December 31, 1998, and did not test in a Y2K compliant domain. Although DLA did not fully comply with the DoD Management Plan, it subjected SAMMS to intensive testing before certification. Additional testing and the logistics end-to-end testing would provide further assurance that the DLA core supply mission performed by SAMMS would be Y2K compliant.

DLA Actions Addressing Year 2000 Problems

DLA implemented and executed the DoD Management Plan as part of its efforts to adequately plan for and manage Y2K risks for SAMMS. DLA complied with the DoD Management Plan in the following areas.

Contracts. DLA had implemented policies requiring the use of Y2K compliance language in SAMMS related contracts as specified in the Federal Acquisition Regulation.

Funding. DLA had identified, prioritized, budgeted, and funded SAMMS Y2K remediation actions. DLA is funding Y2K remediation from operating funds and from the Office of the Secretary of Defense (OSD) Y2K Emergency Supplemental Funding Appropriations.

Information Assurance. DLA had developed programs and procedures to help protect the SAMMS mainframe, mid-tier, and personal computers data processing systems from improper intrusion or data corruption resulting from an information warfare threat to the Defense information infrastructure and SAMMS.

Management Oversight and Reporting. DLA developed an overall planning strategy to make SAMMS Y2K compliant and established a management structure for oversight, implementation, and execution of SAMMS Y2K remediation. DLA documented the overall Y2K strategy in the "Defense Logistics Agency Year 2000 Management Plan, Version 1.2," September 1998², and in the "Test and Evaluation Master Plan (TEMP) for the Defense Logistics Agency (DLA) Year 2000 (Y2K) Program," September 3, 1997. In addition, DLA provided periodic reports to OSD on the status of the Y2K program.

Prioritization and Assessment of Inventory and Infrastructure. DLA determined that 34 of its automated information systems were mission-critical systems. SAMMS was rated 3 of 34 mission-critical DLA systems. In addition, DLA inventoried and assessed for Y2K compliance its automated information systems and supporting infrastructure to include: personal computers and servers, telecommunication equipment, and utilities. DLA had inventoried and tracked the status of SAMMS mainframe, mid-tier, and desktop personal computers. The inventory comprised supporting hardware and software associated with SAMMS that was in need of repair, replacement, or termination before the year 2000. DLA also identified noncompliant software on mid-tiers and had taken action to correct the deficiency by installing upgraded, Y2K compliant software. See the details later in this report.

Y2K Contingency Plans

DLA had taken positive steps to develop contingency plans to ensure that SAMMS Y2K risks were identified and procedures were in place to address potential Y2K failures. DLA met the milestones and the criteria established by the DoD Management Plan for both system and operational contingency plans.

Definition of Contingency Plan. The DoD Management Plan acknowledges that despite best efforts, not all DoD systems will be Y2K compliant by January 1, 2000. A contingency plan provides a means to minimize the adverse impact of disruptions as a result of interface or user data problems. Guidance in the DoD Management Plan addresses three types of Y2K contingency plans: system contingency plans, operational contingency plans, and programmatic contingency plans. The system and operational contingency plans are applicable to SAMMS, but the programmatic plans are not. Programmatic contingency plans apply to

²The DLA Year 2000 Management Plan was under revision at the time of the audit. A revised plan was issued in April 1999.

new systems or systems under renovation that will replace an existing system. Appendix H of the DoD Management Plan makes the following statements regarding the contingency planning process:

The purpose of a contingency plan is to provide a road map of predetermined actions that will streamline decision-making during the contingency to enable resumption of mission operations at the earliest possible time, in the most cost-effective manner. A contingency plan will establish, organize, and document risk assessments, responsibilities, policies and procedures, as well as agreements and understandings for all internal and external entities. Personnel should be trained in the execution of contingency plans and the plans should be tested and updated periodically to assure that they remain current and valid. Y2K system contingency plans address the technical aspects of potential disruptions in systems believed to be Y2K compliant. Plans should include technical workarounds necessary to recover the system or use other systems capabilities to meet the customer's requirement to sustain mission critical capabilities. The operational contingency plan (also known as an operational continuity plan or contingency management plan) deals with continuing and completing missions/functions in "worst case" scenarios. Each core mission/function and critical process should have an operational contingency plan. Operational contingency planning is the primary management tool to prepare for unanticipated disruptions.

SAMMS System Contingency Plan. The "SAMMS Year 2000 Business Continuity and Contingency Plan (BCCP)," November 10, 1998, served as the system level contingency plan for SAMMS. The DoD Management Plan states that the system contingency plan should address processes and procedures for restoring functionality to a disrupted system thought to be Y2K compliant. The SAMMS plan met the basic requirement for system contingency planning outlined in the DoD Management Plan and met the milestone date of December 31, 1998, for completion of the plan.

DLSC Y2K Operational Contingency Plan. DLSC was responsible for developing and integrating the operational contingency plans from the three DSCs into a single plan. The "Defense Logistics Support Command Y2K Business Continuity and Contingency Plan: Y2K Operational Contingency Plan," (Operational Contingency Plan), March 1999, included the supply management functions performed by SAMMS and other DLA materiel management functions. To meet the March 31, 1999, OSD milestone for the development of the Operational Contingency Plan, DLA delegated the responsibility for developing specific sections of the operational contingency plan to the three DSCs.

- DSC Columbus was responsible for the requirements determination process.
- DSC Philadelphia developed the acquisition and contracts sections.
- DSC Richmond developed the asset management and requisition process portion.

Included in the Operational Contingency Plan, as required by the DoD Management Plan, were:

- the definition of the organizational missions and functions of SAMMS,
- mission-critical systems that support SAMMS core,
- emergency notification procedures with points of contact and phone numbers to report the loss or degradation of SAMMS and supporting system functionality,
- procedures for automated information system users to detect possible corrupt SAMMS system data,
- procedures to execute the functions of SAMMS without the assistance of the systems normally supporting SAMMS,
- list of alternative suppliers for mission-critical supplies and a Y2K supplier assessment plan that were developed as backups for SAMMS and for a possible Y2K system failure,
- the impacts that the loss of SAMMS functionality would have on the DLA organization and supply mission,
- recovery procedures SAMMS would use to restore data collected through alternative means, and
- links to relevant system operational contingency plans.

Y2K Operational Contingency Plan Testing. From April through June 1999, DLA planned to test its SAMMS Y2K operational contingency plan as required by the DoD Management Plan. DLA planned tests include procedure review exercises, rehearsals of desktop exercises or simulation exercises, and audits. DLA reported that it had completed testing of mitigation strategies by the June 30, 1999, target date.

Interfaces and Interface Agreements

DLA had not fully documented external interfaces. Because DLA did not follow the guidance in the DoD Management Plan, with respect to developing SAMMS interface agreements, risks remain that DLA needs to address through ensuring further testing of interfaces during the end-to-end testing.

Interface Definition. The DoD Management Plan defines an interface as “a boundary across which two systems communicate.” In addition, the DoD Management Plan states, “an interface might be a hardware connector used to link to other devices, or it might be a convention used to allow communication between two software systems.” External interfaces are defined as, “interfaces that

are outside of the components (i.e.[that is], other DoD, Federal, State, and Local Government, Private Sector, Foreign government, and Foreign private)." Internal interfaces are defined as interfaces that are within the Component.

Interface Strategy. The DLA strategy for external (non-DLA) interfaces consists of establishing interface agreements that focus on whether the current interfaces change date formats. If interfaces change date formats, the DLA strategy is to concentrate on building bridges to accommodate the modified interface and to ensure that Y2K trigger dates are transmitted through the interface. Y2K trigger dates are those dates that have been identified as having the potential to cause a Y2K computational error due to the representation of the year 2000. They include 01-01-00 and 02-29-00. If interface date formats do not change, the DLA strategy focuses on identification and testing of trigger dates.

Interface Agreements. According to the DoD Management Plan, external interface agreements must contain the following minimum information:

- names of interfacing systems;
- description of interface (including data set and date file name);
- interface strategy for both receiving and sending systems (file expansion, procedural code, sliding window, or other specified strategy);
- milestone dates for analyses, programming testing, joint testing, and implementation;
- review and acceptance process;
- point of contact for each interfacing system, to include organization, telephone, and e-mail address; and
- signature of point of contact for each interfacing system.

External Agreements. DLA provided copies of SAMMS interface agreements for 27 external systems. A review of the 27 SAMMS interface agreements disclosed that none met the minimum requirements described in the DoD Management Plan. The following table indicates the required elements included in the interface agreements for the 27 external systems and the requirements that each element met.

SAMMS Interface Agreements: Required Interface Elements Met

<u>Interface Name</u> *	<u>Description</u>	<u>Strategy</u>	<u>Milestones</u>	<u>Review Process</u>	<u>Point of Contact</u>	<u>Signature</u>
1 ACLDB						X
2 ATAV						X
3 CISIL	X	X				X
4 CCSS	X					X
5 CCSS/SPR	X	X				X
6. Coast Guard (Billing System)						X
7 DBMS	X	X	X	X		X
8 DCA						X
9 DO40	X	X				X
10. DO72	X	X				X
11. EUD						X
12. FAA						X
13. FRB						X
14. ITEMAPS						X
15. JCALS						X
16. JEDMICS	X	X				X
17. Marine Corps						X
18. Maritime						X
19. MRDB						X
20. RAM			X	X		X
21. SC&O						X
22. SRD-1						X
23. SSF						X
24. TANDEM	X	X	X	X		X
25. UADPS						X
26. Veterans						X
27. WRS						X

*Complete names or a brief description of interfaces are listed on next page

1. Army Central Logistics Data Base
2. Army Total Asset Visibility
3. Centralized Integrated System International Logistics
4. Commodity Command Standard System
5. Commodity Command Standard System /Special Program Requirements
6. Coast Guard Billing System
7. Defense Business Management System
8. Defense Commissary Agency Supply System
9. War Readiness Material Lists, Requirements and Spares Support Lists (Air Force)
10. Other War Reserve Material Requirements (Air Force)
11. Eliminating Unmatched Disbursements
12. Federal Aviation Administration Supply System
13. Federal Reserve Bank Financial Clearing System
14. Item Applications System
15. Joint Computer Aided Acquisition and Logistics System
16. Joint Engineering Data Management System
17. Marine Corps logistics system for base at Albany
18. Maritime Standard Financial System
19. Material Returns Data Base
20. Residual Asset Management
21. Stock Control and Distribution/Automated Warehouse System
22. Standard Financial System Redesign-1
23. Single Stock Fund System
24. Computer platform used for Navy Asset Visibility System
25. Uniform Automated Data Processing System
26. Department of Veterans Affairs Financial System
27. Marine Corps War Reserve System

Prime Vendor Interfaces. DLA did not develop formal interface agreements with its 52 prime vendor interface partners. DLA explained that all contracts with vendors contained a clause requiring that the vendor be Y2K compliant. In addition, DLA reported that the DSCs and prime vendor functional personnel consulted extensively on both establishing the prime vendor testing requirements and developing the "Prime Vendor Y2K Compliance Assessment Test Plan," September 24, 1998. The test plan contained the methodology for conducting a Y2K compliance assessment of a single prime vendor. A proof of concept demonstration was successfully completed in January 1999. A proof of concept is a demonstration to test a prime vendor's ability to provide supplies in both the 20th and 21st century using representative data. Testing took place at a vendor site and was conducted jointly by the vendor and DLA personnel. As a result of the successful proof of concept demonstration, additional testing was scheduled for the remaining prime vendors from March through July 1999. As of June 30, 1999, 29 prime vendors were successfully tested.

Importance of Interfaces. Accurate data exchanges with all interface partners are critical to the successful operation of SAMMS. Automated information system interface identification, along with properly prepared interface agreements, must be in place to ensure accurate data exchanges. Those agreements also facilitate the preparation of the plans for Y2K testing required by the Deputy Secretary of Defense memorandum, "Year 2000 (Y2K) Verification of National Security Capabilities." The deficiencies in the identification of key interface data in the interface agreements creates risk that DLA has not addressed.

Testing of SAMMS

DLA aggressively pursued renovation and testing of SAMMS as part of the SAMMS Y2K mitigation strategy. However, DLA did not fully comply with the requirements of the DoD Management Plan because DLA did not document all Y2K test results and could not certify SAMMS as compliant by the December 31, 1998, certification and implementation milestone. Additionally, DLA did not perform SAMMS Y2K testing on a Y2K compliant mainframe domain and the SAMMS mainframe production domain on which the SAMMS was operating was not Y2K compliant because the domains used a noncompliant compiler. However, DLA obtained a waiver from OSD to use the noncompliant compiler on the mainframe domains. As a result of the SAMMS Y2K mitigation and testing strategy that DLA executed and the waiver that OSD granted, DLA certified SAMMS as Y2K compliant on March 30, 1999. DLA reported that SAMMS was fully implemented as of April 5, 1999.

SAMMS Y2K Test Strategy. The SAMMS Y2K remediation and test strategy addressed a complex, multi-tiered structure of mainframe, mid-tier, and personal computer applications that SAMMS used in the overall supply mission. DLA began the SAMMS Y2K remediation, testing, and implementation process in July 1996 and certified the SAMMS as Y2K compliant on March 30, 1999. In its overall execution of the SAMMS Y2K remediation effort, DLA substantially accomplished the requirements of the DoD Management Plan for Y2K remediation, testing, and implementation of mission-critical systems. The DLSC developed the "Defense Logistics Support Command Primary Level Field

Activity Year 2000 Program Management Plan," version 3.0 (DLSC Y2K Management Plan), October 1998³, that identified SAMMS Y2K testing responsibilities. DSDC in conjunction with the DSCs developed test plans detailing the various types of testing that DLA performed as part of the SAMMS Y2K remediation. DLA identified noncompliant mainframe, mid-tier, and personal computer software products and either terminated the products, replaced them with Y2K compliant products or obtained a waiver from OSD allowing the continued use of the noncompliant product. In addition to the tests that DLA used as the basis for the SAMMS Y2K certification, DLA planned to perform additional Y2K tests to provide further assurance that SAMMS is Y2K ready and to reduce the risk of Y2K failure.

Test Responsibilities and Procedures. The DLSC Y2K Management Plan assigned the Y2K remediation responsibilities for SAMMS standard applications to DSDC and the SAMMS unique applications to the DSCs. DSDC developed an overall Y2K remediation strategy for SAMMS as well as the test procedures used as the basis for Y2K certification. DSDC also developed date utility tools that identified date usage and introduced logic to make the date references Y2K compliant. The DSCs used the DSDC test approach for developing test plans for the supply center unique applications and used the DSDC software utilities for making date fixes. The individual DSCs also took steps to ensure that the hardware and software for personal computers used by the DSCs in performing SAMMS functions were also Y2K compliant. DLA based the SAMMS Y2K certification on the unit testing of individual SAMMS programs and the testing of the SAMMS conversion to an International Business Machines OS390 (OS390) operating system. DLA documented the procedures to be followed in executing those tests in two separate test plans.

Standard Applications Test Results. As part of the Y2K tests of SAMMS standard applications, DSDC identified SAMMS date usage; tested Y2K critical dates; tested interfaces by simulation; performed regression testing; and reviewed test results with a team comprising functional experts and technical systems personnel from each DSC. DSDC also obtained the services of a contractor to perform an independent review of the test results. It completed checklists to certify the test results and implemented the revised SAMMS applications into production upon completion of testing. As a result of the SAMMS Y2K remediation and testing, DSDC prioritized; remediated; and completed testing of about 4.7 million lines of code, representing 2,942 programs. DSDC completed the testing of mainframe programs on October 13, 1998. On March 17, 1999, it began time machine testing, to validate that SAMMS will operate when the machine date is moved to the year 2000. DSDC also completed the Y2K remediation for mid-tier and personal computer applications by March 30, 1999.

Additionally, as part of the SAMMS Y2K remediation and testing strategy, DSDC developed and executed the "Year 2000 OS390 SAMMS System Conversion DID-Software Test Plan (STP)," August 19, 1998. As part of the OS390 conversion, SAMMS was transferred from a noncompliant MVS-XA

³The DLSC Y2K Management Plan was an evolving document that was under revision at the time of the audit. The most recently approved version is 4.0, dated April 2, 1999.

operating system to the Y2K compliant OS390 operating system. The OS390 operating system is part of the executive software that runs on the SAMMS mainframe test and production domains at the Defense Megacenter Columbus. The conversion and test plan included the testing of SAMMS standard applications and selected DSC unique applications to verify that the applications retained their functionality and interoperability after migrating from the MVS-XA operating system to the OS390 operating system. DSDC completed the OS390 conversion and test on January 23, 1999.

Unique Applications Test Results. As part of the Y2K tests of SAMMS unique applications, each DSC prioritized, remediated, and tested the various SAMMS unique applications that had been developed by the individual DSCs. For the SAMMS unique applications, each DSC identified SAMMS date usage, tested Y2K critical dates, performed regression testing, and reviewed test results with a team comprising functional experts and technical systems personnel from the DSC. DLA also obtained the services of a contractor, who performed an independent review of the test results. In addition, each DSC completed checklists to certify the test results and implemented SAMMS applications into production upon completion of testing. As a result of the SAMMS Y2K remediation and testing to support the system certification on March 30, 1999, the DSCs implemented about 1,215 mainframe mission-critical unique applications and replaced or terminated about 2,086 others. The DSCs also implemented about 97 mid-tier mission-critical unique applications and replaced or terminated 14 others in support of the system certification.

Test Results Documentation. While DLA aggressively pursued renovation and testing of SAMMS, DLA did not retain complete test results because it was not required in the overall testing strategy that DSDC developed. The DoD Management Plan requires that all test results be documented and available upon request. Complete test results were not available to document the SAMMS Y2K testing because some tests did not result in printed output and the overall DSDC Y2K test procedure states that the test results can be disposed of after the test has been approved and the program released. DSCs reported on their SAMMS Y2K certification checklists that either no test results were available or only samples of test results were available for review. DSCs did not retain copies of the test results because not all tests resulted in a hardcopy product and because they verified the accuracy of the test results based on a review of the data on computer screens. Additionally, DLSC personnel stated that it would be too voluminous to document each test; therefore, they did not require that the results of each test be documented in hardcopy. As a result, DLA did not fully comply with the DoD Management Plan because DSDC and the DSCs did not retain complete test results for the Y2K testing of SAMMS standard and unique applications. Although DLA did not document the test results as the tests were being performed, DLA personnel stated that the test results could be recreated if they are needed.

Implementation and Certification Delay. DLA did not meet the December 31, 1998, milestone for certification and implementation required by the DoD Management Plan because DLA correctly would not consider SAMMS Y2K compliant until both the SAMMS applications and the operating environment were Y2K compliant. DLA delayed the SAMMS Y2K certification until

SAMMS was converted to and tested in a mainframe operating environment that was compliant and until Y2K compliant software was installed on the mainframe and mid-tiers. DLA delayed the SAMMS Y2K certification even though DSDC completed testing the SAMMS standard applications on October 13, 1998.

DSDC converted SAMMS from the noncompliant MVS-XA operating environment to the Y2K compliant OS390 mainframe operating environment and completed the testing for that conversion on January 23, 1999. DLA also delayed SAMMS Y2K certification until after it installed a Y2K compliant electronic data interchange (EDI) translator on the mainframe. The EDI product was used by SAMMS applications that supported the clothing, textiles, and medical commodities and the Defense Integrated Subsistence Management System. DLA replaced the noncompliant EDI translator with a Y2K compliant product that was installed and operational as of March 30, 1999. Finally, DLA also completed the installation of about 32 manufacturers developed patches to the DSC mid-tiers on April 5, 1999.

Domain Status. DLA did not perform the testing that was used as the basis for SAMMS Y2K certification in a Y2K compliant mainframe domain. In addition, the SAMMS mainframe production domain in which the SAMMS was operating was not Y2K compliant. Specifically, as of February 11, 1999, the SAMMS mainframe test and production domains that were located at the Defense Megacenter Columbus were not Y2K compliant because the domains used a noncompliant compiler and a noncompliant EDI translator. A compiler is a program that translates the source code written by a programmer into object code that the computer can understand. The DoD Management Plan requires that a system be tested on a compliant domain and in an operationally compliant environment in order to exit the validation phase. According to the DoD Management Plan, any system that was not validated in a compliant environment by January 31, 1999, required a waiver. DLA complied with that requirement and obtained a waiver for the compiler. The Office of the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) granted a waiver to DLA on January 5, 1999, that allowed the use of the noncompliant compiler until the second quarter of calendar year 2000. The noncompliant mainframe was the responsibility of DISA, which we discussed in Inspector General, DoD, Report No. 99-100, "Year 2000 Computing Issues: Defense Logistics Agency Distribution Standard System," March 2, 1999. Additionally, DLA replaced the noncompliant EDI translator with a Y2K compliant product that was installed and operational as of March 30, 1999.

Additional Y2K Testing. In addition to the testing procedure that DLA used as the basis for SAMMS Y2K certification, it performed other tests for the SAMMS Y2K remediation in order to provide further assurance that SAMMS was Y2K ready and to reduce the risk of Y2K failure. The tests were the time machine test, the prime vendor test, and the supplier capability assessment. The prime vendor test and supplier capability assessments were documented in separate test plans and DLA was developing the test plan for the time machine test. The time machine test was to validate that the system would operate when the machine date is moved to year 2000. The prime vendor test was designed to test a prime vendor's capability to deliver goods to DLA into the next century. The supplier capability assessment was to determine the Y2K status of critical suppliers who provided items for which DLA was the integrated materiel manager. Also, the

assessment was to identify critical items and suppliers, prioritize suppliers for assessment, assess suppliers' Y2K compliance, provide assessment results to the Joint Supplier Capability Working Group, and prepare mitigation plans to ensure support to the warfighter.

Summary

DLA had aggressively pursued Y2K remediation of SAMMS. DLA actions included: implementation of Y2K contract clauses; allocation of necessary funds; implementation of an information assurance program; establishment of management oversight and reporting; and prioritization and inventorying of mission-critical systems and infrastructure. However, DLA did not fully comply with the requirements of the DoD Management Plan. It did not document all test results; could not certify SAMMS as Y2K compliant by the December 31, 1998, milestone; and did not test or implement SAMMS in a Y2K compliant domain. Although DLA did not fully comply with the DoD Management Plan, it subjected SAMMS to extensive testing and verification before certification. Additional testing during the April through June 1999 logistics end-to-end testing would provide further assurance that the DLA core supply mission that SAMMS performs will be Y2K compliant.

Management Actions Taken

DLA did not plan to install Y2K upgraded software on the SAMMS mid-tier platforms until May 1999. That date would not meet the March 31, 1999, date required by the DoD Management Plan for completion of the implementation phase for all systems. Based on our recommendation, DLA officials took action to remedy the potential problem area by accelerating the fielding dates of the mid-tier software upgrades to April 5, 1999.

Recommendation and Management Comment

We recommend that the Director, Defense Logistics Agency review the Standard Automated Materiel Management System interfaces to ensure that the critical thread interfaces have been identified and will be tested during the logistics functional end-to-end testing that is scheduled from April through June 1999.

DLA Comments. DLA concurred, stating that a function of the end-to-end testing plan was to ensure that all critical thread interfaces were identified and included in the test. The Capstone (logistics) end-to-end testing began on May 25, 1999, and was scheduled for completion on July 16, 1999.

Appendix A. Audit Process

This is one in a series of reports being issued by the Inspector General, DoD, in accordance with an informal partnership with the DoD Chief Information Officer to monitor DoD efforts to address the Y2K computing challenge. For a listing of audit projects addressing this issue, see the Y2K webpage on the IGnet at <http://www.ignet.gov/>.

Scope and Methodology

Work Performed. We reviewed and evaluated the status of the progress that DLA had made in resolving Y2K computing issues for SAMMS. We evaluated the Y2K efforts of DLA and compared those efforts with the DoD Management Plan. We obtained documentation on system inventory status, interface agreements, contingency plans, test plans, and test results available as of March 31, 1999. We also assessed areas of the DoD Management Plan including contracts, funding, information assurance, management oversight and reporting, prioritization, and assessment of inventory and infrastructure. We interviewed personnel within the DLA Chief Information Officer Y2K Program Office, the DLSC, the Office of the SAMMS Y2K Project Manager, and the DSCs concerning Y2K compliance. We used the information we gathered from the interviews and documents to assess efforts related to the multiple phases of managing the Y2K problem.

Limitation of Audit Scope. Our review did not include nonstandard computer systems or applications that were developed outside the purview of DLA. We did not test Y2K compliance of DLA automated information systems.

DoD-Wide Corporate Level Goals. In response to the Government Performance and Results Act, DoD established 6 DoD-wide corporate-level performance objectives and 14 goals for meeting the objectives. This report pertains to achievement of the following objective and goal.

- **Objective:** Prepare now for an uncertain future. **Goal:** Pursue a focused modernization effort that maintains U.S. qualitative superiority in key war fighting capabilities. **(DoD-3)**

DoD Functional Area Reform Goals. Most major DoD functional areas have also established performance improvement reform objectives and goals. This report pertains to achievement of the following functional area objectives and goals in the Information Technology Management Functional Area.

- **Objective:** Become a mission partner. **Goal:** Serve mission information users as customers. **(ITM-1.2)**

- **Objective:** Provide services that satisfy customer information needs.
Goal: Modernize and integrate Defense information infrastructure. (ITM-2.2)
- **Objective:** Provide services that satisfy customer information needs.
Goal: Upgrade technology base. (ITM-2.3)

High-Risk Area. In its identification of risk areas, the General Accounting Office has specifically designated risk in resolution of the Y2K problem as high. This report provides coverage of that problem and the overall Information Management and Technology high-risk area.

Audit Type, Dates, and Standards. We performed this program audit from January through June 1999 in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD. We did not use any computer-processed data for this audit.

Contacts During the Audit. We visited or contacted individuals and organizations within DoD. Further details are available on request.

Management Control Program. We did not review the management control program related to the overall audit objective because DoD recognized the Y2K issue as a material management control weakness area in the FY 1998 Annual Statement of Assurance.

Summary of Prior Coverage

The General Accounting Office and the Inspector General, DoD, have conducted multiple reviews related to Y2K issues. General Accounting Office reports can be accessed over the Internet at <http://www.gao.gov/>. Inspector General, DoD, reports can be accessed over the Internet at <http://www.dodig.osd.mil/>. The previous reports most relevant to the subject matter of this report are listed below.

General Accounting Office

General Accounting Office Report No. AIMD 97-106, "Defense Computers: Issues Confronting the Defense Logistics Agency in Addressing Year 2000 Problems," August 12, 1997.

Inspector General, DoD

Inspector General, DoD, Report No. 99-172, "Year 2000 Status of the Army Total Asset Visibility System," May 28, 1999.

Inspector General, DoD, Report No. 99-100, "Year 2000 Computing Issues: Defense Logistics Agency Distribution Standard System," March 2, 1999.

Inspector General, DoD, Report No. 99-082, "Year 2000 Computing Issues: Related to the Defense Automatic Addressing System Center," February 18, 1999.

Appendix B. Report Distribution

Office of the Secretary of Defense

Under Secretary of Defense for Acquisition and Technology

 Deputy Under Secretary of Defense (Logistics)

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 Director, Defense Logistics Studies Information Exchange

Under Secretary of Defense (Comptroller)

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Inspector General, General Services Administration

Congressional Committees and Subcommittees, Chairman and Ranking Minority Member

Senate Committee on Appropriations
Senate Subcommittee on Defense, Committee on Appropriations
Senate Committee on Armed Services
Senate Committee on Governmental Affairs
Senate Special Committee on the Year 2000 Technology Problem
House Committee on Appropriations
House Subcommittee on Defense, Committee on Appropriations
House Committee on Armed Services
House Committee on Government Reform
House Subcommittee on Government Management, Information, and Technology,
 Committee on Government Reform
House Subcommittee on National Security, Veterans Affairs, and International Relations,
 Committee on Government Reform
House Subcommittee on Technology, Committee on Science

Defense Logistics Agency Comments



IN REPLY
REFER TO

DDAI

DEFENSE LOGISTICS AGENCY
HEADQUARTERS
8725 JOHN J. KINGMAN ROAD, SUITE 2533
FT. BELVOIR, VIRGINIA 22060-6221

JUN 28 1999

MEMORANDUM FOR ASSISTANT INSPECTOR GENERAL FOR AUDITING,
DEPARTMENT OF DEFENSE

SUBJECT: Year 2000 Computing Issues: Defense Logistics Agency -
Standard Automated Materiel Management System
(Project No. 81D-9021.02)

The Defense Logistics Agency (DLA) has reviewed the subject 26 May 1999 draft report and agrees with the finding and recommendation. Detailed comments are shown below.

FINDING: Status of the Standard Automated Materiel Management System (SAMMS) Year 2000 Program. DLA and its three subordinate supply centers had taken action to ensure that SAMMS would be Y2K compliant. Specifically, DIA:

- implemented Y2K contract clauses
- allocated necessary funds
- implemented an information assurance program
- establish management oversight and reporting
- prioritized and inventoried mission-critical systems and infrastructure
- developed contingency and test plans, and performed Y2K testing

However, DIA did not fully comply with the requirements of the DoD Management Plan. DIA did not comply with the requirements because it did not fully document interfaces, did not document all test results, did not meet the Y2K certification milestone of December 31, 1998, and did not test in a Y2K compliant domain. Although DIA did not fully comply with the DoD Management Plan, it subjected SAMMS to intensive testing before certification. Additional testing and the logistics end-to-end testing would provide further assurance that the DLA core supply mission performed by SAMMS would be Y2K compliant.

DLA COMMENTS: Concur. The Capstone end-to-end testing is underway beginning on May 25, 1999, and scheduled for completion on July 16, 1999.

RECOMMENDATION: We recommend that the Director, Defense Logistics Agency, review the Standard Automated Materiel Management System interfaces to ensure that the critical thread interfaces have been identified and will be tested during the logistics functional end-to-end testing that is scheduled from April through June 1999.

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DLA COMMENTS: Concur. As a part of the Capstone end-to-end testing plan, one of the functions was to assure that all critical thread interfaces were identified and included in the test. The Capstone end-to-end testing began on May 25, 1999, and is scheduled for completion July 16, 1999.

DISPOSITION: Action is ongoing. Estimated Completion Date: July 16, 1999.



E. R. GAMBERLIN
REAR ADMIRAL, SC, USN
DEPUTY DIRECTOR

Audit Team Members

The Readiness and Logistics Support Directorate, Office of the Assistant Inspector General for Auditing, DoD, prepared this report. Personnel of the Office of the Inspector General, DoD, who contributed to the report are listed below.

Shelton R. Young
Tilghman A. Schraden
Kathryn L. Palmer
Arthur J. Maurer
Debra E. Alford
Robert M. Paluck
Kayode O. Bamgbade
Mary K. Reynolds

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OAIG-AUD (ATTN: AFTS Audit Suggestions)
Inspector General, Department of Defense
400 Army Navy Drive (Room 801)
Arlington, VA 22202-2884

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